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INTERNATIONAL

TECHNICAL SPECIFICATION DATA-TABLES

Contents

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Metric Tube Sizes

Aluminium Brass and 90/10 Copper Nickel Iron Tube Metric sizes to B.S. 2871 Part 2 Table 3 for Sea Water Piplines and other Engineering purposes.

Equivalents: Aluminium Brass ASTM B111; CZ110. Copper Nickel Iron ASTM C70600; CN102.

Tube Size mm	O.D. MAX mm	O.D. MIN mm	Preferred standard thickness mm	Other standard thickness mm	Other* standard thickness mm	Theoretical of preferred Al Brass kilos per metre	Weights standard 90/10 cni kilos per metre	Working Pressures For Al/Brass and CNI 90/10 @ 100°C kg/cm²	psi	@ 50°C kg/cm²	psi
6	6.045	5.965	0.8	1.0	0.6	0.109	0.117	11.4	162	11.8	168
8	8.045	7.965	0.8	1.0	0.6	0.151	0.162	8.6	122	8.8	125
10	10.045	9.965	0.8	1.0	0.6	0.193	0.207	6.9	98	7.1	101
12	12.045	11.965	0.8	1.0	0.6	0.235	0.252	5.7	81	5.9	84
16	16.045	15.965	1.0	1.5	-	0.393	0.420	21.4	305	22.0	313
20	20.055	19.975	1.0	2.0	-	0.498	0.532	17.1	244	17.6	250
25	25.055	24.975	1.5	2.0	-	0.924	0.987	41.1	585	42.3	602
30	30.055	29.975	1.5	2.0	-	1.120	1.197	34.2	487	35.3	502
38	38.07	37.99	1.5	2.0	-	1.434	1.533	27.0	385	27.8	395
44.5	44.57	44.49	1.5	2.0	-	1.690	1.806	23.1	328	23.8	338
57	57.20	57.12	1.5	2.0	-	2.181	2.331	18.0	256	18.6	264
76.1	76.30	76.15	2.0	2.5	-	3.878	4.144	22.5	320	23.2	330
88.9	89.15	89.00	2.5	3.0	-	5.666	6.055	27.0	384	27.8	395
108	108.25	108.00	2.5	3.0	-	6.910	7.385	22.2	316	22.8	324
133	133.50	133.25	2.5	3.0	-	8.548	9.135	18.0	256	18.6	265
159	159.50	159.25	2.5	3.0	-	10.251	10.955	15.1	215	15.5	220
193.7	194.50	194.25	3.0	3.5	-	15.013	16.044	15.9	226	16.4	233
219.1	219.90	218.30	3.0	4.0	-	16.978	18.144	14.1	200	14.5	206
267	268.00	266.40	3.0	4.0	-	20.750	22.176	11.5	164	11.9	169
323.9	324.90	323.30	4.0	4.5	-	33.536	35.840	13.7	196	14.1	201
368	369.00	367.40	4.0	4.5	-	38.147	40.768	12.1	172	12.5	178
419	420.00	418.40	4.0	4.5	-	43.492	46.480	10.6	151	10.9	155
457.2	458.20	455.20	4.0	4.5	-	47.495	50.758	9.7	139	10.0	142
508	509.00	506.00	4.5	5.0	-	58.876	63.028	10.1	144	10.4	148

NOTE: Tubes for pipelines are usually stress relieved suitable for cold bending or other fabrication processes and unless otherwise specified, are supplied in either the TA, ½H, or O condition appropriate to material and size at the manufacturer's discretion.

*the working pressure (in line with stated temperatures) are based on the "preferred wall thickness" dimensions, thicker wall tube/pipe are available upon request.

Metric Aluminium Brass Heating Coils

Outside Diameter	Wall Thickness	Weight per metre/kg	W/Pressures @ 150°C Al/Brass kg/cm²	psi	CNI 90/10 kg/cm²	psi
16 mm	1.5	0.570	59.5	846	60.5	860
16 mm	2.0	0.734	99.2	1411	100.8	1433
20 mm	1.5	0.727	47.6	677	48.4	688
30 mm	1.5	1.120	31.8	452	32.3	459
38 mm	2.0	1.886	41.8	594	42.4	603
44.5 mm	2.0	2.227	35.7	508	36.2	515

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Imperial Tube Sizes

Aluminium Brass and 90/10 Copper Nickel Iron Tube Imperial sizes to B.S. 2871 for Sea Water Piplines and other Engineering purposes.

Equivalents: Aluminium Brass ASTM B111; CZ110. Copper Nickel ASTM C70600; CN102.

Nominal Bore	External Diameter		*Wall Thickness			Theoretical Weights				Working Pressures For Al/Brass and CNI 90/10			
						Al Brass		90/10 cni		100°C		50°C	
(ins.)	(ins.)	(mm)	S.W.G.	(ins.)	(mm.)	lb./ft	kg/m	lb./ft	kg./m.	kg/cm²	psi	kg/cm²	psi
0.5	0.596	15.14	18	0.048	1.22	0.30	0.44	0.32	0.47	42.5	604	43.8	623
0.75	0.846	21.49	18	0.048	1.22	0.44	0.65	0.46	0.69	30.0	427	30.8	438
1.0	1.112	28.25	17	0.056	1.42	0.67	1.00	0.72	1.07	32.5	462	33.4	475
1.25	1.362	34.60	17	0.056	1.42	0.83	1.24	0.89	1.32	26.5	377	27.3	388
1.5	1.612	40.95	17	0.056	1.42	0.99	1.47	1.06	1.57	22.4	319	23.1	328
2.0	2.128	54.05	16	0.064	1.63	1.50	2.23	1.60	2.39	22.3	317	23.0	327
2.5	2.628	66.75	16	0.064	1.63	1.86	2.77	1.99	2.96	18.1	257	18.6	264
3.0	3.144	79.86	15	0.072	1.83	2.51	3.74	2.68	3.99	18.5	263	19.1	272
3.5	3.660	92.96	14	0.080	2.03	3.25	4.84	3.48	5.17	18.9	269	19.4	276
4.0	4.184	106.27	13	0.092	2.34	4.28	6.36	4.57	6.80	20.5	292	21.1	300
4.5	4.684	118.97	13	0.092	2.34	4.80	7.14	5.13	7.63	18.3	260	18.8	267
5.0	5.184	131.67	13	0.092	2.34	5.32	7.92	5.69	8.46	16.5	235	17.0	242
6.0	6.208	157.68	12	0.104	2.64	7.21	10.73	7.70	11.47	16.4	233	16.9	240
7.0	7.208	183.08	12	0.104	2.64	8.39	12.49	8.97	13.34	14.1	201	14.6	208
8.0	8.208	208.48	12	0.104	2.64	9.57	14.25	10.23	15.22	12.4	176	12.8	182
9.0	9.232	234.49	11	0.116	2.95	12.01	17.87	12.83	19.09	12.9	183	13.2	188
10.0	10.256	260.50	10	0.128	3.25	14.73	21.91	15.73	23.41	13.1	186	13.5	192
11.0	11.288	286.72	9	0.144	3.66	18.23	27.13	19.47	28.98	13.9	198	14.3	203
12.0	12.288	312.12	9	0.144	3.66	19.86	29.56	21.22	31.58	12.8	182	13.1	186
14.0	14.320	363.73	8	0.160	4.06	25.74	38.30	27.49	40.91	12.5	178	12.8	182
16.0	16.320	414.53	8	0.160	4.06	29.37	43.71	31.38	46.69	10.9	155	11.3	161
18.0	18.320	465.33	8	0.160	4.06	33.00	49.12	35.26	52.47	9.7	138	10.0	142
20.0	20.352	516.94	7	0.176	4.47	40.34	60.02	43.09	64.12	9.9	141	10.1	144
22.0	22.352	567.74	7	0.176	4.47	44.33	65.97	-	-	9.0	128	9.2	131
24.0	24.384	619.35	6	0.192	4.88	52.76	78.52	-	-	9.1	129	9.4	134

NOTE: Tubes for pipelines are usually stress relieved suitable for cold bending or other fabrication processes and unless otherwise specified, are supplied in either the TA, ½H, or O condition appropriate to material and size at the manufacturer's discretion.

*Thicker wall tube/pipe available upon request.

Imperial Aluminium Brass Heating Coils

Nominal Bore		Outside Diameter		S.W.G.	*Wall Thickness		Weights		W/Pressures @ 150°C			
									Al/Brass		CNI 90/10	
ins.	mm.	ins.	mm		ins.	mm.	lb./ft	kg./metre	kg/cm²	psi	kg/cm²	psi
1/2	12.70	0.596	15.14	18	0.048	1.22	0.30	0.44	39.4	560	40.1	570
3/4	19.05	0.846	21.49	16	0.064	1.63	0.57	0.85	52.0	739	52.8	751
1	25.40	1.112	28.25	16	0.064	1.63	0.76	1.13	39.6	563	40.2	572
1	25.40	1.112	28.25	14	0.080	2.03	0.94	1.40	57.5	818	58.4	830
11/4	31.75	1.362	34.60	14	0.080	2.03	1.17	1.73	47.0	668	47.7	678
11/2	38.10	1.612	40.95	14	0.080	2.03	1.39	2.07	39.7	565	40.3	573

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Non Ferrous Tube Specifications

Materials	Designation	Material No. to DIN	UNS-No	Bs Alloy No.	AFNOR Designation	JIS	Composition to DIN
Copper	E-Cu58	2.0065	C 110 00	C 101/C 102	Cu/al	C 1100	1787
	SE-Cu	2.0070	C 103 00	C 103	Cu/cl	-	1787
	SF-Cu	2.0090	C 122 00	C 106	Cu/b	C 1220	1787
Copper low-alloyed	CuAsP	2.1491	C 142 00	C 107	-	-	-
	TZ-Cu* (CuZn0.5)	2.0205	-	-	-	-	17666
	HSM-Cu* (CuFe2P)	2.1310	C 194 00	-	-	-	17666
Copper-Zinc alloys	CuZn5	2.0220	C 210 00	-	CuZn5	-	17680
	CuZn10	2.0230	C 220 00	CZ 101	CuZn10	C 2200	17660
	CuZn15	2.0240	C 230 00	CZ 102	CuZn15	C 2300	17660
	CuZn20	2.0250	C 240 00	CZ 103	CuZn20	-	17660
	CuZn30	2.0260	C 260 00	CZ 106	CuZn30	C 2800	17660
	CuZn36	2.0330	C 270 00	CZ 108**	-	C 2700	17660
	CuZn37	2.0320	C 274 00	CZ 108	CuZn37	-	17660
	Cun20A12	2.0460	C 687 00	CZ 110	CuZn22A12	C 8870	17660
	CuZn28Snl	2.0470	C 443 00	CZ 111	CuZn29Snl	C 4430	17660
	CuZn38Pbl.5	2.0370	C 353 00	CZ 119/CZ120**	CuZn38Pb2**	-	17660
	CuZn40Pb2	2.0402	C 380 00**	CZ 122	CuZn39Pb2	-	17660
Copper-Tin alloys	CuSn2	2.1010	C 505 00	-	-	-	-
	CuSn6	2.1020	C 519 00	PB 103	U-E5P	C 5212	17662
	CuSn8	2.1030	C 521 00	PB 104	U-E9P	C 5191	17662
Copper-Nickel alloys	CuNil0FelMn	2.0872	C 706 00	CN 102	CuNil0FelMn	C 7060	17664
	CuNi20	-	-	CN 104	-	-	-
	CuNi30MnlFe	2.0882	C 716 00	CN 107	CuNi30MnlFe	C 7160	17664
	CuNi30Fe2Mn2	2.0883	-	CN 108	-	-	17664
Copper-Aluminium alloys	CuA15As	2.0810	C608 00	CA 101	-	-	17665

Tubes can be also supplied to foreign standards, such as ANSI/ASTM, ASME, BS, AFNOR, JIS etc.

* Schmöle Designation   ** Deviating from DIN 17660

1) UNS = Unified Numbering System
2) BS = British Standard
3) AFNOR = Association Francaise de Normalisation
4) JIS = Japanese Standards Association

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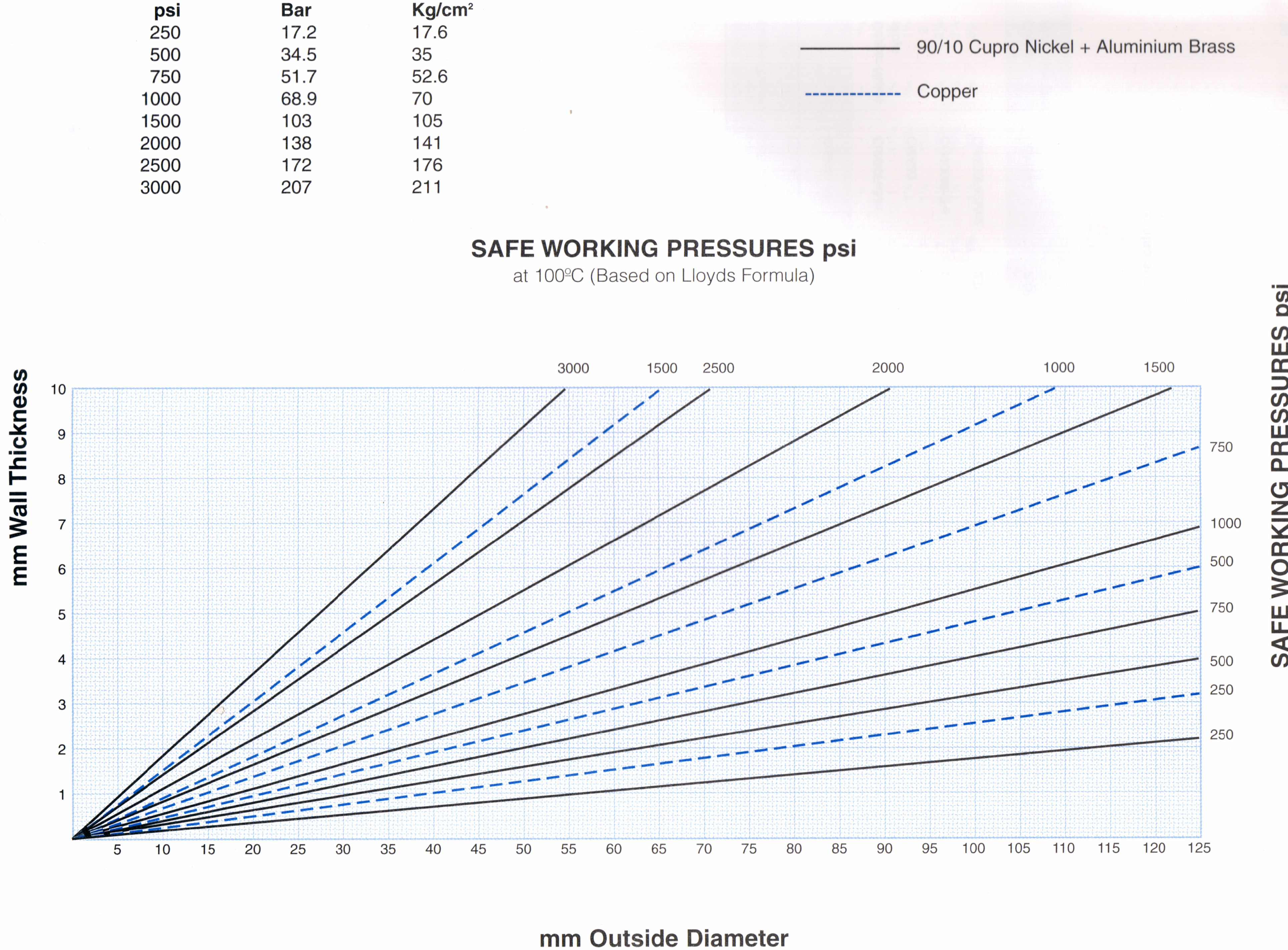
psi	Bar	Kg/cm²
250	17.2	17.6
500	34.5	35
750	51.7	52.6
1000	68.9	70
1500	103	105
2000	138	141
2500	172	176
3000	207	211

SAFE WORKING PRESSURES psi
at 100ºC (Based on Lloyds Formula)



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"IPS" International Pipe Sizes

Dimensions and Weights of ASA standard, Seamless and Welded Steel Pipe (mm & kg/m)

Nominal Bore	Outside diameter	5S	10S	10	20	30	Standard wall & 40S	40	60	Extra strong & 80S	80	100	120	140	160	Double extra strong
in																
1/8	10.3		1.24				1.73	1.73		2.41	2.41					
			0.28				**0.36**	**0.36**		**0.46**	**0.46**					
1/4	13.7		1.65				2.24	2.24		3.02	3.02					
			0.49				**0.63**	**0.63**		**0.80**	**0.80**					
3/8	17.1		1.65				2.31	2.31		3.2	3.2					
			0.63				**0.85**	**0.85**		**1.10**	**1.10**					
1/2	21.3	1.65	2.11				2.77	2.77		3.73	3.73				4.78	7.47
		0.80	**1.00**				**1.27**	**1.27**		**1.62**	**1.62**				**1.94**	**2.55**
3/4	26.7	1.65	2.11				2.87	2.87		3.91	3.91				5.56	7.82
		1.03	**1.28**				**1.68**	**1.68**		**2.19**	**2.19**				**2.90**	**3.63**
1	33.4	1.65	2.77				3.38	3.38		4.55	4.55				6.35	9.09
		1.29	**2.08**				**2.50**	**2.50**		**3.23**	**3.23**				**4.18**	**5.45**
1 1/4	42.2	1.65	2.77				3.56	3.56		4.85	4.85				6.35	9.70
		1.65	**2.69**				**3.38**	**3.38**		**4.46**	**4.46**				**5.58**	**7.76**
1 1/2	48.3	1.65	2.77				3.68	3.68		5.08	5.08				7.14	10.16
		1.90	**3.12**				**4.05**	**4.05**		**5.41**	**5.41**				**7.22**	**9.55**
2	60.3	1.65	2.77				3.91	3.91		5.54	5.54				8.74	11.07
		2.38	**3.94**				**5.44**	**5.44**		**7.49**	**7.49**				**11.08**	**13.45**
2 1/2	73.0	2.11	3.05				5.16	5.16		7.01	7.01				9.52	14.02
		3.70	**5.26**				**8.68**	**8.68**		**11.42**	**11.42**				**14.88**	**20.41**
3	88.9	2.11	3.05				5.49	5.49		7.62	7.62				11.13	15.24
		4.50	**6.45**				**11.29**	**11.29**		**15.27**	**15.27**				**20.98**	**27.67**
3 1/2	101.6	2.11	3.05				5.74	5.74		8.08	8.08					
		5.20	**7.40**				**13.37**	**13.37**		**18.63**	**18.63**					
4	114.3	2.11	3.05				6.02	6.02		8.56	8.56		11.13		13.49	17.12
		5.81	**8.34**				**16.07**	**16.07**		**22.31**	**22.31**		**28.25**		**33.48**	**41.02**
5	141.3	2.77	3.40				6.55	6.55		9.52	9.52		12.7		15.88	19.05
		9.45	**11.56**				**21.78**	**21.78**		**30.95**	**30.95**		**40.24**		**49.11**	**57.42**
6	168.3	2.77	3.40				7.11	7.11		10.97	10.97		14.27		18.26	21.95
		11.31	**13.82**				**28.26**	**28.26**		**42.56**	**42.56**		**54.20**		**67.22**	**79.18**
8	219.1	2.77	3.76		6.35	7.04	8.18	8.18	10.31	12.7	12.7	15.09	18.26	20.62	23.01	22.22
		14.78	**19.94**		**33.03**	**36.72**	**42.53**	**42.53**	**52.88**	**64.63**	**64.63**	**75.80**	**90.32**	**101.04**	**111.32**	**107.87**
10	273	3.40	4.19		6.35	7.8	9.27	9.27	12.7	12.7	15.09	18.26	21.44	25.40	28.58	25.40
		22.62	**27.83**		**41.70**	**51.00**	**60.29**	**60.29**	**81.46**	**81.46**	**95.95**	**114.59**	**132.74**	**154.94**	**172.14**	**154.94**
12	323.9	3.96	4.57		6.35	8.38	9.52	10.31	14.27	12.7	17.47	21.44	25.40	28.58	33.34	25.40
		33.00	**36.00**		**49.81**	**65.07**	**73.82**	**79.67**	**108.97**	**97.36**	**131.70**	**159.52**	**186.77**	**206.96**	**238.11**	**186.77**
14	355.6	3.96	4.78	6.35	7.92	9.52	9.52	11.13	15.09	12.7	19.05	23.82	27.79	31.75	35.71	
		34.23	**41.18**	**54.63**	**67.95**	**81.28**	**81.28**	**94.31**	**126.49**	**107.28**	**157.94**	**194.82**	**224.42**	**253.14**	**281.38**	
16	406.4	4.19	4.78	6.35	7.52	9.52	9.52	12.7	16.64	12.7	21.44	26.19	30.96	36.52	40.49	
		41.60	**47.33**	**62.58**	**77.88**	**93.21**	**93.21**	**123.18**	**159.98**	**123.18**	**203.16**	**245.32**	**286.44**	**332.62**	**364.85**	
18	457.2	4.19	4.78	6.35	7.92	11.13	9.52	14.27	19.05	12.7	23.82	29.36	34.92	39.69	45.24	
		46.83	**53.18**	**70.53**	**87.81**	**122.12**	**105.14**	**155.90**	**205.62**	**139.07**	**254.19**	**309.44**	**363.19**	**408.01**	**459.18**	
20	508	4.78	5.54	6.35	9.52	12.7	9.52	15.09	20.62	12.7	26.19	32.54	38.10	44.45	50.01	
		59.22	**68.50**	**78.47**	**117.07**	**154.97**	**117.07**	**183.12**	**247.79**	**154.97**	**310.90**	**381.04**	**440.93**	**507.54**	**564.14**	
24	609.6	5.54	6.35	6.35	9.52	14.27	9.52	17.48	24.61	12.7	30.96	38.89	46.02	52.39	59.54	
		82.60	**94.37**	**94.37**	**140.94**	**209.54**	**140.94**	**254.74**	**354.64**	**186.75**	**441.10**	**546.92**	**639.18**	**718.94**	**806.61**	
26	660.4			7.92	12.7		9.52			12.7						
				127.58	**202.65**		**152.87**			**202.65**						
30	762			7.92	12.7	15.88	9.52			12.7						
				147.33	**234.44**	**291.81**	**176.73**			**234.44**						
32	812.8			7.92	12.7	15.88	9.52	17.48		12.7						
				156.58	**260.33**	**311.67**	**188.66**	**352.28**		**260.33**						
34	863.6			7.92	12.7	15.88	9.52	17.48		12.7						
				166.82	**266.35**	**331.54**	**200.59**	**363.91**		**266.35**						
36	914.4			7.92	12.7	15.88	9.52	19.05		12.7						
				177.12	**282.12**	**351.41**	**212.52**	**420.17**		**282.12**						

Pipe Specifications

ASTM	BS	DIN	WERKSTOFF	ASTM	BS	DIN	WERKSTOFF	ASTM	BS	DIN	WERKSTOFF
A120	1387	1629 St 00		A106 Gr.C	3602/35	17175 17Mn4		A335 Gr.P11	3604/621	17175 22 Cr.Mo44	1.7350
A53Gr.A.	3601/23	1629 M St 35		A333 Gr.1	3603/LT50	TT St 35N		A335 Gr.P22	3604/622	17175 10 Cr.Mo910	1.7380
A53Gr.B	3601/27	1629 M St 45		A333 Gr.3	3603/503LT100	17175 16Ni 14	1.5639	A335 Gr.P5	3604/625	17175 12 Cr.Mo195	1.7362
A106Gr.A	3602/23	17175 M St 35.8	1.0350	A335 Gr.P1	3604/240	17175 16 Mo5	1.5423	A335 Gr.P7	3604/627	17175 X 12 Cr.Mo7	1.7368

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Boiler Tubes

Specifications for Boiler & Super Heater Tubing

BSS 3059: 78 Pt 1 320 (Carbon Steel)
Available in Welded, Hot Finished and Cold Finished quality. For use at temperatures not exceeding 400 degrees centigrade.

Equivalent American Specifications: ASTM A1 78 and ASTM A 192. Equivalent German specification: DIN 17175 St.35, 8 Grades 1/2.

BSS 3059: 78 Pt 2 360 (Carbon Steel)
Available in Welded and Seamless quality. For use at higher tempertatures, having specified room temperature properties and proof stress values at elevated temperatures. This grade provides for two catergories of room temperature test procedure, designated TC1 and TC2, the former requiring non-destructive acceptance testing. Provision is also made for a choice of dimensional tolerance, designated SC1 and SC2 (Seamless only).

Equivalent American Specifications: ASTM A226, ASTM A192. German equivalent: DIN 17175 St.35, 8 Grades 2/3.

BSS 3059: 78 Pt 2 440 (Carbon Steel)
Available in Welded and Seamless quality with test and dimension tolerance as Grade 360. Higher carbon and manganese content provides better yield and tensile strength than Grade 320 or 360.

Equivalent American Specifications: ASTM A210 grade A1 or C. German equivalent: DIN 17175 St.45, 8, Grades 1 - 3.

BSS 3059: 78 Pt. 2 620 (1% cr. 0.5% moly alloy steel)
Available in Welded and Seamless quality with test and dimension tolerance choice as per Pt. 2 carbon grades. Generally used for Super-Heater applications where higher temperatures require alloying elements to stabilise and maintain mechanical properties. This grade also affords greater resistance to corrosion.

Equivalent American Specification: ASTM A213 T12. German equivalent: DIN 17175 13Cr.Mo44.

BSS 3059: 78 Pt. 2. 622 (2, 5% Cr. 1% Moly. alloy steel)
Available in Welded and Seamless quality with test and dimension tolerance choice. This grade performs the same function as 620 but through a higher temperature range. Under this grade a choice of heat-treatment is provided i.e. annealed [(622-440) and normalised/tempered (622-490)].

Equivalent American Specification: ASTM A213 T22. GERMAN EQUIVALENT: DIN 17175 10CrMo910

Size & Range

OUTSIDE DIA. ins.	mm	Gauge	WALL THICKNESS ins.	mm
3/4	19.05	10*	.128	3.2
		12*	.104	2.6
		14*	.080	2.0
		16*	.064	1.6
1	25.4	10*	.128	3.2
		12*	.104	2.6
		14*	.080	2.0
		16*	.064	1.6
1 1/4	31.8	8	.160	4.0
		9	.144	3.6
		10	.128	3.2
		11	.116	2.9
		12	.104	2.6
1 1/2	38.1		.312	8.0
			.250	6.4
		8	.160	4.0
		9	.144	3.6
		12	.104	2.6
		14	.080	2.0
1 3/4	44.5		.312	8.0
			.250	6.4
		8	.160	4.0
		9	.144	3.6
		10	.128	3.2
2	51		.375	9.5
			.312	8.0
			.250	6.4
		6*	.192	4.9
		7	.176	4.5
		9	.144	3.6
		10*	.128	3.2
		12	.104	2.6
2 1/4	57		.375	9.5
			.312	8.0
			.250	6.4
		8	.160	4.0
		9	.144	3.6
		10	.128	3.2
21/2	63.5		.375	9.5
			.312	8.0
			.250	6.4
		6	.192	4.9
		8	.160	4.0
		9	.144	3.6
		10	.128	3.2
		12	.104	2.6
2 3/4	70		.375	9.5
			.312	8.0
			.250	6.4
		8	.160	4.0
		9	.144	3.6
		10	.128	3.2
		12	.104	2.6
3	76.1		.375	9.5
			.312	8.0
			.250	6.4
		6	.192	4.9
		8	.160	4.0
		9	.144	3.6
		10	.128	3.2
3 1/4	82.5		.375	9.5
			.312	8.0
			.250	6.4
		6	.192	4.9
		8	.160	4.0
		9	.144	3.6
		10	.128	3.2
3 1/2	88.9		.375	9.5
			.312	8.0
			.250	6.4
		6	.192	4.9
		8	.160	4.0
		9	.144	3.6
		10	.128	3.2
4	101.6		.375	9.5
			.312	8.0
			.250	6.4
		6	.192	4.9
		8	.160	4.0

marcon engineering

Steel Flanges

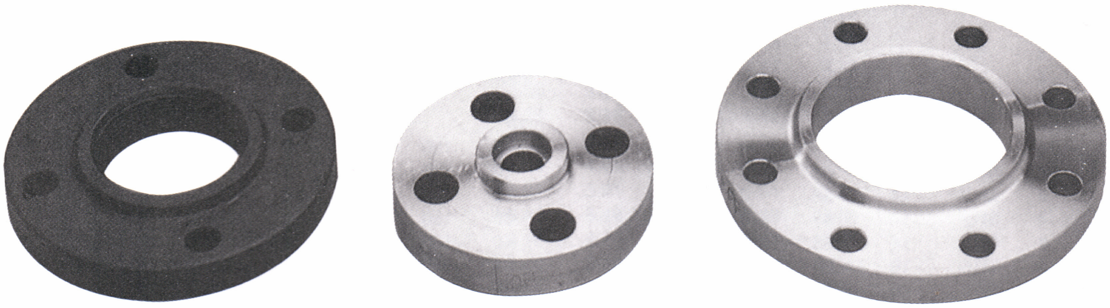
Flange Dimensions

BS = British Standard

ANSI = American Standard

NP = Din Standard

JIS = Japanese Standard



1/2 in (15 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	3 3/4	2 5/8	4	1/2	9/16	-	-	3/16
D	3 3/4	2 5/8	4	1/2	9/16	-	-	3/16
E	3 3/4	2 5/8	4	1/2	9/16	-	-	1/4
F	3 3/4	2 5/8	4	1/2	9/16	-	-	3/8
H	4 1/2	3 1/4	4	5/8	11/16	2 1/4	1/16	1/2
J	4 1/2	3 1/4	4	5/8	11/16	2 1/4	1/16	5/8
K	4 1/2	3 1/4	4	5/8	11/16	2 1/2	1/16	3/4
R	4 1/2	3 1/4	4	5/8	11/16	2 1/2	1/16	3/4
S	5	3 1/2	4	3/4	7/8	2 1/2	1/16	7/8
T	5 1/2	4	4	3/4	7/8	2 1/2	1/16	1
ANSI								
150	3 1/2	2 3/8	4	1/2	5/8	1 3/8	1/16	7/16
300	3 3/4	2 5/8	4	1/2	5/8	1 3/8	1/16	9/16
600	3 3/4	2 5/8	4	1/2	5/8	1 3/8	1/4	9/16
900	4 3/4	3 1/4	4	3/4	7/8	1 3/8	1/2	7/8
1500	4 3/4	3 1/4	4	3/4	7/8	1 3/8	1/4	7/8
NP								
6	80	55	4	M10	11	40	2	12
10	95	65	4	M12	14	45	2	14
16	95	65	4	M12	14	45	2	14
25	95	65	4	M12	14	45	2	16
40	95	65	4	M12	14	45	2	16
64	105	75	4	M12	14	45	2	20
100	105	75	4	M12	14	45	2	20
160	105	75	4	M12	14	45	2	24
JIS								
5K	80	60	4	M10	12	48	1	9

3/4 in (20 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	4	2 7/8	4	1/2	9/16	-	-	3/16
D	4	2 7/8	4	1/2	9/16	-	-	3/16
E	4	2 7/8	4	1/2	9/16	-	-	1/4
F	4	2 7/8	4	1/2	9/16	-	-	3/8
H	4 1/2	3 1/4	4	5/8	11/16	2 1/4	1/16	1/2
J	4 1/2	3 1/4	4	5/8	11/16	2 1/4	1/16	5/8
K	4 1/2	3 1/4	4	5/8	11/16	2 1/2	1/16	3/4
R	4 1/2	3 1/4	4	5/8	11/16	2 1/2	1/16	3/4
S	5	3 1/2	4	3/4	7/8	2 1/2	1/16	7/8
T	5 1/2	4	4	3/4	7/8	2 1/2	1/16	1
ANSI								
150	3 7/8	2 3/4	4	1/2	5/8	1 11/16	1/16	1/2
300	4 5/8	3 1/4	4	5/8	3/4	1 11/16	1/16	5/8
600	4 5/8	3 1/4	4	5/8	3/4	1 11/16	1/4	5/8
900	5 1/8	3 1/2	4	3/4	7/8	1 11/16	1/4	1
1500	5 1/8	3 1/2	4	3/4	7/8	1 11/16	1/4	1
NP								
6	90	65	4	M10	11	50	2	14
10	105	75	4	M12	14	58	2	16
16	105	75	4	M12	14	58	2	16
25	105	75	4	M12	14	58	2	18
40	105	75	4	M12	14	58	2	18
64	130	90	4	M16	18	58	2	22
100	130	90	4	M16	18	58	2	22
160	130	90	4	M16	18	58	2	26
JIS								
5K	85	65	4	M10	12	48	1	9

1 in (25 mm) nominal bore.

Table	Dia. of flange (in)	Bolt Circle dia. (in)	Number of bolts	Dia. of bolts (in)	Dia. of holes (in)	Dia. of raised face (in)	Height of raised face (in)	Thickness of flange (in)
BS								
A	$4\frac{1}{2}$	$3\frac{1}{4}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{3}{16}$
D	$4\frac{1}{2}$	$3\frac{1}{4}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{3}{16}$
E	$4\frac{1}{2}$	$3\frac{1}{4}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{5}{32}$
F	$4\frac{3}{4}$	$3\frac{7}{16}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{3}{8}$
H	$4\frac{3}{4}$	$3\frac{7}{16}$	4	$\frac{5}{8}$	$\frac{11}{16}$	$2\frac{1}{2}$	$\frac{1}{16}$	$\frac{5}{16}$
J	$4\frac{3}{4}$	$3\frac{7}{16}$	4	$\frac{5}{8}$	$\frac{11}{16}$	$2\frac{1}{2}$	$\frac{1}{16}$	$\frac{3}{4}$
K	5	$3\frac{3}{4}$	4	$\frac{5}{8}$	$\frac{11}{16}$	3	$\frac{1}{16}$	$\frac{7}{8}$
R	5	$3\frac{3}{4}$	4	$\frac{5}{8}$	$\frac{11}{16}$	3	$\frac{1}{16}$	$\frac{7}{8}$
S	$5\frac{1}{2}$	4	4	$\frac{3}{4}$	$\frac{7}{8}$	3	$\frac{1}{16}$	1
T	$5\frac{3}{4}$	$4\frac{1}{4}$	4	$\frac{3}{4}$	$\frac{7}{8}$	3	$\frac{1}{16}$	$1\frac{1}{8}$
ANSI								
150	$4\frac{1}{4}$	$3\frac{1}{8}$	4	$\frac{1}{2}$	$\frac{5}{8}$	2	$\frac{1}{16}$	$\frac{9}{16}$
300	$4\frac{7}{8}$	$3\frac{1}{2}$	4	$\frac{5}{8}$	$\frac{3}{4}$	2	$\frac{1}{16}$	$\frac{11}{16}$
600	$4\frac{7}{8}$	$3\frac{1}{2}$	4	$\frac{5}{8}$	$\frac{3}{4}$	2	$\frac{1}{4}$	$\frac{11}{16}$
900	$5\frac{7}{8}$	4	4	$\frac{7}{8}$	1	2	$\frac{1}{4}$	$1\frac{1}{8}$
1500	$5\frac{7}{8}$	4	4	$\frac{7}{8}$	1	2	$\frac{1}{4}$	$1\frac{1}{8}$
NP								
6	100	75	4	M10	11	60	2	14
10	115	85	4	M12	14	68	2	16
16	115	85	4	M12	14	68	2	16
25	115	85	4	M12	14	68	2	18
40	115	85	4	M12	14	68	2	18
64	140	100	4	M16	18	68	2	24
100	140	100	4	M16	18	68	2	24
160	140	100	4	M16	18	68	2	26
JIS								
5K	95	75	4	M10	12	62	1	10
10K	125	90	4	M16	19	70	1	14
16K	125	90	4	M16	19	70	1	14

$1\frac{1}{2}$ in (40 mm) nominal bore.

Table	Dia. of flange (in)	Bolt Circle dia. (in)	Number of bolts	Dia. of bolts (in)	Dia. of holes (in)	Dia. of raised face (in)	Height of raised face (in)	Thickness of flange (in)
BS								
A	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{1}{4}$
D	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{1}{4}$
E	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{11}{32}$
F	$5\frac{1}{2}$	$4\frac{1}{8}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
H	$5\frac{1}{2}$	$4\frac{1}{8}$	4	$\frac{5}{8}$	$\frac{11}{16}$	$3\frac{1}{4}$	$\frac{1}{16}$	$\frac{11}{16}$
J	$5\frac{1}{2}$	$4\frac{1}{8}$	4	$\frac{5}{8}$	$\frac{11}{16}$	$3\frac{1}{4}$	$\frac{1}{16}$	$\frac{7}{8}$
K	6	$4\frac{1}{2}$	4	$\frac{3}{4}$	$\frac{7}{8}$	$3\frac{1}{2}$	$\frac{1}{16}$	1
R	6	$4\frac{1}{2}$	4	$\frac{3}{4}$	$\frac{7}{8}$	$3\frac{1}{2}$	$\frac{1}{16}$	1
S	$6\frac{1}{4}$	$4\frac{3}{4}$	4	$\frac{3}{4}$	$\frac{7}{8}$	$3\frac{1}{2}$	$\frac{1}{16}$	$1\frac{1}{8}$
T	$6\frac{3}{4}$	$5\frac{1}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$3\frac{1}{2}$	$\frac{1}{16}$	$1\frac{3}{8}$
ANSI								
150	5	$3\frac{7}{8}$	4	$\frac{1}{2}$	$\frac{5}{8}$	$2\frac{7}{8}$	$\frac{1}{16}$	$\frac{11}{16}$
300	$6\frac{1}{8}$	$4\frac{1}{2}$	4	$\frac{3}{4}$	$\frac{7}{8}$	$2\frac{7}{8}$	$\frac{1}{16}$	$\frac{13}{16}$
600	$6\frac{1}{8}$	$4\frac{1}{2}$	4	$\frac{3}{4}$	$\frac{7}{8}$	$2\frac{7}{8}$	$\frac{1}{4}$	$\frac{7}{8}$
900	7	$4\frac{7}{8}$	4	1	$1\frac{1}{8}$	$2\frac{7}{8}$	$\frac{1}{4}$	$1\frac{1}{4}$
1500	7	$4\frac{7}{8}$	4	1	$1\frac{1}{8}$	$2\frac{7}{8}$	$\frac{1}{4}$	$1\frac{1}{4}$
NP								
6	130	100	4	M12	14	80	3	16
10	150	110	4	M16	18	88	3	16
16	150	110	4	M16	18	88	3	16
25	150	110	4	M16	18	88	3	20
40	150	110	4	M16	18	88	3	20
64	170	125	4	M20	22	88	3	26
100	170	125	4	M20	22	88	3	26
160	170	125	4	M20	22	88	3	30
JIS								
5K	120	95	4	M12	15	78	2	12
10K	140	105	4	M16	19	85	2	16
16K	140	105	4	M16	19	85	2	16

$1\frac{1}{4}$ in (32 mm) nominal bore.

Table	Dia. of flange (in)	Bolt Circle dia. (in)	Number of bolts	Dia. of bolts (in)	Dia. of holes (in)	Dia. of raised face (in)	Height of raised face (in)	Thickness of flange (in)
BS								
A	$4\frac{3}{4}$	$3\frac{7}{16}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{1}{4}$
D	$4\frac{3}{4}$	$3\frac{7}{16}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{1}{4}$
E	$4\frac{3}{4}$	$3\frac{7}{16}$	4	$\frac{1}{2}$	$\frac{9}{16}$	-	-	$\frac{5}{16}$
F	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
H	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{5}{8}$	$\frac{11}{16}$	3	$\frac{1}{16}$	$\frac{11}{16}$
J	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{5}{8}$	$\frac{11}{16}$	3	$\frac{1}{16}$	$\frac{3}{4}$
K	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{5}{8}$	$\frac{11}{16}$	3	$\frac{1}{16}$	$\frac{7}{8}$
R	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{5}{8}$	$\frac{11}{16}$	3	$\frac{1}{16}$	$\frac{7}{8}$
S	$5\frac{3}{4}$	$4\frac{1}{4}$	4	$\frac{3}{4}$	$\frac{7}{8}$	$3\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{8}$
T	$6\frac{1}{4}$	$4\frac{3}{4}$	4	$\frac{7}{8}$	1	$3\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{4}$
ANSI								
150	$4\frac{5}{8}$	$3\frac{1}{2}$	4	$\frac{1}{2}$	$\frac{5}{8}$	$2\frac{1}{2}$	$\frac{1}{16}$	$\frac{5}{8}$
300	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{5}{8}$	$\frac{3}{4}$	$2\frac{1}{2}$	$\frac{1}{16}$	$\frac{3}{4}$
600	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{5}{8}$	$\frac{3}{4}$	$2\frac{1}{2}$	$\frac{1}{4}$	$\frac{13}{16}$
900	$6\frac{1}{4}$	$4\frac{3}{8}$	4	$\frac{7}{8}$	1	$2\frac{1}{2}$	$\frac{1}{4}$	$1\frac{1}{8}$
1500	$6\frac{1}{4}$	$4\frac{3}{8}$	4	$\frac{7}{8}$	1	$2\frac{1}{2}$	$\frac{1}{4}$	$1\frac{1}{8}$
NP								
6	120	90	4	M12	14	70	2	16
10	140	100	4	M16	18	78	2	16
16	140	100	4	M16	18	78	2	16
25	140	100	4	M16	18	78	2	18
40	140	100	4	M16	18	78	2	18
64	155	110	4	M20	22	78	2	24
100	155	110	4	M20	22	78	2	24
160	155	110	4	M20	22	78	2	28
JIS								
5K	114	90	4	M12	15	72	2	12
10K	135	100	4	M16	19	80	2	16
16K	135	100	4	M16	19	80	2	16

2 in (50 mm) nominal bore.

Table	Dia. of flange (in)	Bolt Circle dia. (in)	Number of bolts	Dia. of bolts (in)	Dia. of holes (in)	Dia. of raised face (in)	Height of raised face (in)	Thickness of flange (in)
BS								
A	6	$4\frac{1}{2}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{16}$
D	6	$4\frac{1}{2}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{16}$
E	6	$4\frac{1}{2}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{3}{8}$
F	$6\frac{1}{2}$	5	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{8}$
H	$6\frac{1}{2}$	5	4	$\frac{5}{8}$	$\frac{11}{16}$	4	$\frac{1}{16}$	$\frac{3}{4}$
J	$6\frac{1}{2}$	5	4	$\frac{3}{4}$	$\frac{7}{8}$	4	$\frac{1}{16}$	1
K	$6\frac{1}{2}$	5	8	$\frac{5}{8}$	$\frac{11}{16}$	4	$\frac{1}{16}$	1
R	$6\frac{1}{2}$	5	8	$\frac{5}{8}$	$\frac{11}{16}$	4	$\frac{1}{16}$	1
S	$6\frac{3}{4}$	$5\frac{1}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$3\frac{1}{2}$	$\frac{1}{16}$	$1\frac{1}{4}$
T	$7\frac{1}{4}$	$5\frac{3}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	4	$\frac{1}{16}$	$1\frac{3}{8}$
ANSI								
150	6	$4\frac{3}{4}$	4	$\frac{5}{8}$	$\frac{3}{4}$	$3\frac{5}{8}$	$\frac{1}{16}$	$\frac{3}{4}$
300	$6\frac{1}{2}$	5	8	$\frac{5}{8}$	$\frac{3}{4}$	$3\frac{5}{8}$	$\frac{1}{16}$	$\frac{7}{8}$
600	$6\frac{1}{2}$	5	8	$\frac{5}{8}$	$\frac{3}{4}$	$3\frac{5}{8}$	$\frac{1}{4}$	1
900	$8\frac{1}{2}$	$6\frac{1}{2}$	8	$\frac{7}{8}$	1	$3\frac{5}{8}$	$\frac{1}{4}$	$1\frac{1}{2}$
1500	$8\frac{1}{2}$	$6\frac{1}{2}$	8	$\frac{7}{8}$	1	$3\frac{5}{8}$	$\frac{1}{4}$	$1\frac{1}{2}$
NP								
6	140	110	4	M12	14	90	3	16
10	165	125	4	M16	18	102	3	18
16	165	125	4	M16	18	102	3	18
25	165	125	4	M16	18	102	3	20
40	165	125	4	M16	18	102	3	20
64	180	135	4	M20	22	102	3	26
100	195	145	4	M24	26	102	3	28
160	195	145	4	M24	26	102	3	34
JIS								
5K	130	105	4	M12	15	88	2	14
10K	155	120	4	M16	19	100	2	16
16K	155	120	8	M16	19	100	2	16

$2\frac{1}{2}$in (65 mm) nominal bore.

Table	Dia. of flange	Bolt Circle dia.	Number of bolts	Dia. of bolts	Dia. of holes	Dia. of raised face	Height of raised face	Thickness of flange
	in	in		in	in	in	in	in
BS								
A	$6\frac{1}{2}$	5	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{16}$
D	$6\frac{1}{2}$	5	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{16}$
E	$6\frac{1}{2}$	5	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{13}{32}$
F	$7\frac{1}{4}$	$5\frac{3}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{8}$
H	$7\frac{1}{4}$	$5\frac{3}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	$4\frac{1}{2}$	$\frac{1}{16}$	$\frac{3}{4}$
J	$7\frac{1}{4}$	$5\frac{3}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$4\frac{1}{2}$	$\frac{1}{16}$	1
K	$7\frac{1}{4}$	$5\frac{3}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$4\frac{1}{2}$	$\frac{1}{16}$	$1\frac{1}{8}$
R	$7\frac{1}{4}$	$5\frac{3}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$4\frac{1}{2}$	$\frac{1}{16}$	$1\frac{1}{8}$
S	$7\frac{1}{4}$	$5\frac{3}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	4	$\frac{1}{16}$	$1\frac{1}{4}$
T	8	$6\frac{1}{2}$	8	$\frac{7}{8}$	1	$4\frac{1}{2}$	$\frac{1}{16}$	$1\frac{5}{8}$
ANSI								
150	7	$5\frac{1}{2}$	4	$\frac{5}{8}$	$\frac{3}{4}$	$4\frac{1}{8}$	$\frac{1}{16}$	$\frac{7}{8}$
300	$7\frac{1}{2}$	$5\frac{7}{8}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$4\frac{1}{8}$	$\frac{1}{16}$	1
600	$7\frac{1}{2}$	$5\frac{7}{8}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$4\frac{1}{8}$	$\frac{1}{4}$	$1\frac{1}{8}$
900	$9\frac{5}{8}$	$7\frac{1}{2}$	8	1	$1\frac{1}{8}$	$4\frac{1}{8}$	$\frac{1}{4}$	$1\frac{5}{8}$
1500	$9\frac{5}{8}$	$7\frac{1}{2}$	8	1	$1\frac{1}{8}$	$4\frac{1}{8}$	$\frac{1}{4}$	$1\frac{5}{8}$
NP								
6	160	130	4	M12	14	110	3	16
10	185	145	4	M16	18	122	3	18
16	185	145	4	M16	18	122	3	18
25	185	145	8	M16	18	122	3	22
40	185	145	8	M16	18	122	3	22
64	205	160	8	M20	22	122	3	26
100	220	170	8	M24	26	122	3	30
160	220	170	8	M24	26	122	3	36
JIS								
5K	155	130	4	M12	15	112	2	14
10K	175	140	4	M16	19	120	2	18
16K	175	140	8	M16	19	120	2	18

4 in (100 mm) nominal bore.

Table	Dia. of flange	Bolt Circle dia.	Number of bolts	Dia. of bolts	Dia. of holes	Dia. of raised face	Height of raised face	Thickness of flange
	in	in		in	in	in	in	in
BS								
A	$8\frac{1}{2}$	7	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{3}{8}$
D	$8\frac{1}{2}$	7	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{3}{8}$
E	$8\frac{1}{2}$	7	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
F	9	$7\frac{1}{2}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{3}{4}$
H	9	$7\frac{1}{2}$	8	$\frac{5}{8}$	$\frac{11}{16}$	6	$\frac{1}{16}$	1
J	9	$7\frac{1}{2}$	8	$\frac{3}{4}$	$\frac{7}{8}$	6	$\frac{1}{16}$	$1\frac{3}{8}$
K	$9\frac{1}{2}$	$7\frac{3}{4}$	8	$\frac{7}{8}$	1	6	$\frac{1}{16}$	$1\frac{3}{8}$
R	$9\frac{1}{2}$	$7\frac{3}{4}$	8	$\frac{7}{8}$	1	6	$\frac{1}{16}$	$1\frac{3}{8}$
S	$9\frac{3}{4}$	8	8	1	$1\frac{1}{8}$	$6\frac{1}{4}$	$\frac{1}{16}$	$1\frac{5}{8}$
T	$11\frac{1}{4}$	$9\frac{1}{4}$	8	$1\frac{1}{8}$	$1\frac{1}{4}$	$6\frac{1}{4}$	$\frac{1}{16}$	$2\frac{1}{4}$
ANSI								
150	9	$7\frac{1}{2}$	8	$\frac{5}{8}$	$\frac{3}{4}$	$6\frac{3}{16}$	$\frac{1}{16}$	$\frac{15}{16}$
300	10	$7\frac{7}{8}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$6\frac{3}{16}$	$\frac{1}{16}$	$1\frac{1}{4}$
600	$10\frac{3}{4}$	$8\frac{1}{2}$	8	$\frac{7}{8}$	1	$6\frac{3}{16}$	$\frac{1}{4}$	$1\frac{1}{2}$
900	$11\frac{1}{2}$	$9\frac{1}{4}$	8	$1\frac{1}{8}$	$1\frac{1}{4}$	$6\frac{3}{16}$	$\frac{1}{4}$	$1\frac{3}{4}$
1500	$12\frac{1}{4}$	$9\frac{1}{2}$	8	$1\frac{1}{4}$	$1\frac{3}{8}$	$6\frac{3}{16}$	$\frac{1}{4}$	$2\frac{1}{8}$
NP								
6	210	170	4	M16	18	148	3	18
10	220	180	8	M16	18	158	3	20
16	220	180	8	M16	18	158	3	20
25	235	190	8	M20	22	162	3	26
40	235	190	8	M20	22	162	3	26
64	250	200	8	M24	26	162	3	32
100	265	210	8	M27	30	162	3	36
160	265	210	8	M27	30	162	3	44
JIS								
5K	200	165	8	M16	19	145	2	16
10K	210	175	8	M16	19	155	2	18
16K	225	185	8	M20	23	160	2	22

3 in (80 mm) nominal bore.

Table	Dia. of flange	Bolt Circle dia.	Number of bolts	Dia. of bolts	Dia. of holes	Dia. of raised face	Height of raised face	Thickness of flange
	in	in		in	in	in	in	in
BS								
A	$7\frac{1}{4}$	$5\frac{3}{4}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{3}{8}$
D	$7\frac{1}{4}$	$5\frac{3}{4}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{3}{8}$
E	$7\frac{1}{4}$	$5\frac{3}{4}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{7}{16}$
F	8	$6\frac{1}{2}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{8}$
H	8	$6\frac{1}{2}$	8	$\frac{5}{8}$	$\frac{11}{16}$	5	$\frac{1}{16}$	$\frac{7}{8}$
J	8	$6\frac{1}{2}$	8	$\frac{3}{4}$	$\frac{7}{8}$	5	$\frac{1}{16}$	$1\frac{1}{4}$
K	8	$6\frac{1}{2}$	8	$\frac{3}{4}$	$\frac{7}{8}$	5	$\frac{1}{16}$	$1\frac{1}{4}$
R	8	$6\frac{1}{2}$	8	$\frac{3}{4}$	$\frac{7}{8}$	5	$\frac{1}{16}$	$1\frac{1}{4}$
S	8	$6\frac{1}{2}$	8	$\frac{7}{8}$	1	$4\frac{1}{2}$	$\frac{1}{16}$	$1\frac{3}{8}$
T	$9\frac{1}{4}$	$7\frac{1}{2}$	8	1	$1\frac{1}{8}$	5	$\frac{1}{16}$	$1\frac{7}{8}$
ANSI								
150	$7\frac{1}{2}$	6	4	$\frac{5}{8}$	$\frac{3}{4}$	5	$\frac{1}{16}$	$\frac{15}{16}$
300	$8\frac{1}{4}$	$6\frac{5}{8}$	8	$\frac{3}{4}$	$\frac{7}{8}$	5	$\frac{1}{16}$	$1\frac{1}{8}$
600	$8\frac{1}{4}$	$6\frac{5}{8}$	8	$\frac{3}{4}$	$\frac{7}{8}$	5	$\frac{1}{4}$	$1\frac{1}{4}$
900	$9\frac{1}{2}$	$7\frac{1}{2}$	8	$\frac{7}{8}$	1	5	$\frac{1}{4}$	$1\frac{1}{2}$
1500	$10\frac{1}{2}$	8	8	$1\frac{1}{8}$	$1\frac{1}{4}$	5	$\frac{1}{4}$	$1\frac{7}{8}$
NP								
6	190	150	4	M16	18	128	3	18
10	200	160	8	M16	18	138	3	20
16	200	160	8	M16	18	138	3	20
25	200	160	8	M16	18	138	3	24
40	200	160	8	M16	18	138	3	24
64	215	170	8	M20	22	138	3	30
100	230	180	8	M24	26	138	3	34
160	230	180	8	M24	26	138	3	40
JIS								
5K	180	145	4	M16	19	125	2	14
10K	185	150	8	M16	19	130	2	18
16K	200	160	8	M20	23	135	2	20

5 in (125 mm) nominal bore.

Table	Dia. of flange	Bolt Circle dia.	Number of bolts	Dia. of bolts	Dia. of holes	Dia. of raised face	Height of raised face	Thickness of flange
	in	in		in	in	in	in	in
BS								
A	10	$8\frac{1}{4}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
D	10	$8\frac{1}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
E	10	$8\frac{1}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{9}{16}$
F	11	$9\frac{1}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	-	-	$\frac{7}{8}$
H	11	$9\frac{1}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	7	$\frac{1}{16}$	$1\frac{1}{8}$
J	11	$9\frac{1}{4}$	8	$\frac{7}{8}$	1	7	$\frac{1}{16}$	$1\frac{1}{2}$
K	11	$9\frac{1}{4}$	12	$\frac{7}{8}$	1	7	$\frac{1}{16}$	$1\frac{5}{8}$
R	11	$9\frac{1}{4}$	12	$\frac{7}{8}$	1	7	$\frac{1}{16}$	$1\frac{5}{8}$
S	$11\frac{1}{4}$	$9\frac{1}{4}$	12	$\frac{7}{8}$	1	$7\frac{1}{2}$	$\frac{1}{16}$	$1\frac{3}{4}$
T	$12\frac{3}{4}$	$10\frac{3}{4}$	12	$1\frac{1}{8}$	$1\frac{1}{4}$	$8\frac{1}{4}$	$\frac{1}{16}$	$2\frac{5}{8}$
ANSI								
150	10	$8\frac{1}{2}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$7\frac{5}{16}$	$\frac{1}{16}$	$\frac{15}{16}$
300	11	$9\frac{1}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$7\frac{5}{16}$	$\frac{1}{16}$	$1\frac{3}{8}$
600	13	$10\frac{1}{2}$	8	1	$1\frac{1}{8}$	$7\frac{5}{16}$	$\frac{1}{4}$	$1\frac{3}{4}$
900	$13\frac{3}{4}$	11	8	$1\frac{1}{4}$	$1\frac{3}{8}$	$7\frac{5}{16}$	$\frac{1}{4}$	2
1500	$14\frac{3}{4}$	$11\frac{1}{2}$	8	$1\frac{1}{2}$	$1\frac{5}{8}$	$7\frac{5}{16}$	$\frac{1}{4}$	$2\frac{7}{8}$
NP								
6	240	200	8	M16	18	178	3	20
10	250	210	8	M16	18	188	3	22
16	250	210	8	M16	18	188	3	22
25	270	220	8	M24	26	188	3	28
40	270	220	8	M24	26	188	3	28
64	295	240	8	M27	30	188	3	34
100	315	250	8	M30	33	188	3	42
160	315	250	8	M30	33	188	3	54
JIS								
5K	235	200	8	M16	19	180	2	16
10K	250	210	8	M20	23	185	2	20
16K	270	225	8	M22	25	195	2	22

6 in (150 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	11	$9\frac{1}{4}$	4	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
D	11	$9\frac{1}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
E	11	$9\frac{1}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	-	-	$\frac{11}{16}$
F	12	$10\frac{1}{4}$	12	$\frac{3}{4}$	$\frac{7}{8}$	-	-	$\frac{7}{8}$
H	12	$10\frac{1}{4}$	12	$\frac{3}{4}$	$\frac{7}{8}$	$8\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{8}$
J	12	$10\frac{1}{4}$	12	$\frac{7}{8}$	1	$8\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{2}$
K	12	$10\frac{1}{4}$	12	$\frac{7}{8}$	1	$8\frac{1}{4}$	$\frac{1}{16}$	$1\frac{5}{8}$
R	12	$10\frac{1}{4}$	12	$\frac{7}{8}$	1	$8\frac{1}{4}$	$\frac{1}{16}$	$1\frac{3}{4}$
S	$12\frac{3}{4}$	$10\frac{3}{4}$	12	$1\frac{3}{8}$	$1\frac{1}{8}$	$8\frac{1}{4}$	$\frac{1}{16}$	2
T	$14\frac{3}{4}$	$12\frac{1}{2}$	12	$1\frac{1}{4}$	$1\frac{3}{8}$	9	$\frac{1}{16}$	$2\frac{7}{8}$
ANSI								
150	11	$9\frac{1}{2}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$8\frac{1}{2}$	$\frac{1}{16}$	1
300	$12\frac{1}{2}$	$10\frac{5}{8}$	12	$\frac{3}{4}$	$\frac{7}{8}$	$8\frac{1}{2}$	$\frac{1}{16}$	$1\frac{7}{16}$
600	14	$11\frac{1}{2}$	12	1	$1\frac{1}{8}$	$8\frac{1}{2}$	$\frac{1}{4}$	$1\frac{7}{8}$
900	15	$12\frac{1}{2}$	12	$1\frac{1}{8}$	$1\frac{1}{4}$	$8\frac{1}{2}$	$\frac{1}{4}$	$2\frac{3}{16}$
1500	$15\frac{1}{2}$	$12\frac{1}{2}$	12	$1\frac{3}{8}$	$1\frac{1}{2}$	$8\frac{1}{2}$	$\frac{1}{4}$	$3\frac{1}{4}$
NP								
6	265	225	8	M16	18	202	3	20
10	285	240	8	M20	22	212	3	22
16	285	240	8	M20	22	212	3	22
25	300	250	8	M24	26	218	3	30
40	300	250	8	M24	26	218	3	30
64	345	280	8	M30	33	218	3	36
100	355	290	12	M30	33	218	3	48
160	355	290	12	M30	33	218	3	62
JIS								
5K	265	230	8	M16	19	210	2	18
10K	280	240	8	M20	23	215	2	22
16K	305	260	12	M22	25	230	2	24

7 in (175 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	12	$10\frac{1}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
D	12	$10\frac{1}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
E	12	$10\frac{1}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	-	-	$\frac{3}{4}$
F	$13\frac{1}{4}$	$11\frac{1}{2}$	12	$\frac{3}{4}$	$\frac{7}{8}$	-	-	$\frac{7}{8}$
H	$13\frac{1}{4}$	$11\frac{1}{2}$	12	$\frac{3}{4}$	$\frac{7}{8}$	$9\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{4}$
J	$13\frac{1}{4}$	$11\frac{1}{2}$	12	$\frac{7}{8}$	1	$9\frac{1}{4}$	$\frac{1}{16}$	$1\frac{5}{8}$
K	$13\frac{1}{2}$	$11\frac{1}{2}$	12	1	$1\frac{1}{8}$	$9\frac{1}{4}$	$\frac{1}{16}$	$1\frac{3}{4}$
R	$13\frac{1}{2}$	$11\frac{1}{2}$	12	1	$1\frac{1}{8}$	$9\frac{1}{4}$	$\frac{1}{16}$	$1\frac{7}{8}$
S	$14\frac{3}{4}$	$12\frac{1}{2}$	12	$1\frac{1}{8}$	$1\frac{1}{4}$	$9\frac{3}{4}$	$\frac{1}{16}$	$2\frac{1}{4}$
T	17	$14\frac{1}{2}$	12	$1\frac{3}{8}$	$1\frac{1}{2}$	$9\frac{3}{4}$	$\frac{1}{16}$	$3\frac{1}{4}$
ANSI								
150	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-
600	-	-	-	-	-	-	-	-
900	-	-	-	-	-	-	-	-
1500	-	-	-	-	-	-	-	-
NP								
6	-	-	-	-	-	-	-	-
10	315	270	8	M20	22	242	3	24
16	315	270	8	M20	22	242	3	24
25	330	280	12	M24	26	248	3	26
40	350	295	12	M27	30	260	3	32
64	375	310	12	M30	33	260	3	40
100	385	320	12	M30	33	260	3	54
160	390	320	12	M33	36	260	3	68
JIS								
5K	300	260	8	M20	23	235	2	18
10K	305	265	12	M20	23	240	2	22
16K	-	-	-	-	-	-	-	-

8 in (200 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	$13\frac{1}{4}$	$11\frac{1}{2}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
D	$13\frac{1}{4}$	$11\frac{1}{2}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{1}{2}$
E	$13\frac{1}{4}$	$11\frac{1}{2}$	8	$\frac{3}{4}$	$\frac{7}{8}$	-	-	$\frac{3}{4}$
F	$14\frac{1}{2}$	$12\frac{3}{4}$	12	$\frac{3}{4}$	$\frac{7}{8}$	-	-	1
H	$14\frac{1}{2}$	$12\frac{3}{4}$	12	$\frac{3}{4}$	$\frac{7}{8}$	$10\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{4}$
J	$14\frac{1}{2}$	$12\frac{3}{4}$	12	$\frac{7}{8}$	1	$10\frac{1}{4}$	$\frac{1}{16}$	$1\frac{5}{8}$
K	$14\frac{1}{2}$	$12\frac{1}{2}$	12	1	$1\frac{1}{8}$	$10\frac{1}{4}$	$\frac{1}{16}$	$1\frac{7}{8}$
R	$14\frac{1}{2}$	$12\frac{3}{4}$	12	1	$1\frac{1}{8}$	$10\frac{1}{4}$	$\frac{1}{16}$	2
S	$16\frac{1}{4}$	14	12	$1\frac{1}{4}$	$1\frac{3}{8}$	$10\frac{3}{4}$	$\frac{1}{16}$	$2\frac{1}{2}$
T	$18\frac{3}{4}$	16	12	$1\frac{1}{2}$	$1\frac{5}{8}$	$11\frac{3}{4}$	$\frac{1}{16}$	$3\frac{1}{2}$
ANSI								
150	$13\frac{1}{2}$	$11\frac{3}{4}$	8	$\frac{3}{4}$	$\frac{7}{8}$	$10\frac{5}{8}$	$\frac{1}{16}$	$1\frac{1}{8}$
300	15	13	12	$\frac{7}{8}$	1	$10\frac{5}{8}$	$\frac{1}{16}$	$1\frac{5}{8}$
600	$16\frac{1}{2}$	$13\frac{3}{4}$	12	$1\frac{1}{8}$	$1\frac{1}{4}$	$10\frac{5}{8}$	$\frac{1}{4}$	$2\frac{3}{16}$
900	$18\frac{1}{2}$	$15\frac{1}{2}$	12	$1\frac{3}{8}$	$1\frac{1}{2}$	$10\frac{5}{8}$	$\frac{1}{4}$	$2\frac{1}{2}$
1500	19	$15\frac{1}{2}$	12	$1\frac{5}{8}$	$1\frac{3}{4}$	$10\frac{5}{8}$	$\frac{1}{4}$	$3\frac{5}{8}$
NP								
6	320	280	8	M16	18	258	3	22
10	340	295	8	M20	22	268	3	24
16	340	295	12	M20	22	268	3	24
25	360	310	12	M24	26	278	3	28
40	375	320	12	M27	30	285	3	34
64	415	345	12	M33	36	285	3	46
100	430	360	12	M33	36	285	3	60
160	430	360	12	M33	36	285	3	76
JIS								
5K	320	280	8	M20	23	255	2	20
10K	330	290	12	M20	23	265	2	22
16K	350	305	12	M22	25	275	2	26

9 in (225 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	$14\frac{1}{2}$	$12\frac{3}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{8}$
D	$14\frac{1}{2}$	$12\frac{3}{4}$	8	$\frac{5}{8}$	$\frac{11}{16}$	-	-	$\frac{5}{8}$
E	$14\frac{1}{2}$	$12\frac{3}{4}$	12	$\frac{3}{4}$	$\frac{7}{8}$	-	-	$\frac{13}{16}$
F	16	14	12	$\frac{7}{8}$	1	-	-	$1\frac{1}{8}$
H	16	14	12	$\frac{7}{8}$	1	$11\frac{1}{4}$	$\frac{1}{16}$	$1\frac{3}{8}$
J	16	14	12	1	$1\frac{1}{8}$	$11\frac{1}{4}$	$\frac{1}{16}$	$1\frac{3}{4}$
K	16	14	16	1	$1\frac{1}{8}$	$11\frac{1}{4}$	$\frac{1}{16}$	2
R	16	14	16	1	$1\frac{1}{8}$	$11\frac{1}{4}$	$\frac{1}{16}$	$2\frac{1}{8}$
S	$17\frac{1}{4}$	$15\frac{1}{4}$	16	$1\frac{1}{8}$	$1\frac{1}{4}$	$11\frac{3}{4}$	$\frac{1}{16}$	$2\frac{7}{8}$
T	20	$17\frac{1}{2}$	16	$1\frac{3}{8}$	$1\frac{1}{2}$	13	$\frac{1}{16}$	$3\frac{3}{4}$
ANSI								
150	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-
600	-	-	-	-	-	-	-	-
900	-	-	-	-	-	-	-	-
1500	-	-	-	-	-	-	-	-
NP								
6	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-
160	-	-	-	-	-	-	-	-
JIS								
5K	345	305	12	M20	23	280	2	20
10K	350	310	12	M20	23	285	2	22
16K	-	-	-	-	-	-	-	-

10 in (250 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	16	14	8	3/4	7/8	-	-	5/8
D	16	14	8	3/4	7/8	-	-	5/8
E	16	14	12	3/4	7/8	-	-	7/8
F	17	15	12	7/8	1	-	-	1 1/8
H	17	15	12	7/8	1	12 1/4	1/16	1 3/8
J	17	15	12	1	1 1/8	12 1/4	1/16	1 7/8
K	17	15	16	1	1 1/8	12 1/4	1/16	2
R	17	15 1/4	16	1	1 1/8	12 1/4	1/16	2 3/8
S	19	16 3/4	16	1 1/4	1 3/8	13	1/16	3 1/8
T	22	19 1/4	16	1 1/2	1 5/8	14	1/16	4 1/4
ANSI								
150	16	14 1/4	12	7/8	1	12 3/4	1/16	1 3/16
300	17 1/2	15 1/4	16	1	1 1/8	12 3/4	1/16	1 7/8
600	20	17	16	1 1/4	1 3/8	12 3/4	1/4	2 1/2
900	21 1/2	18 1/2	16	1 3/8	1 1/2	12 3/4	1/4	2 3/4
1500	23	19	12	1 7/8	2	12 3/4	1/4	4 1/4
NP								
6	375	335	12	M16	18	312	3	24
10	395	350	12	M20	22	320	3	26
16	405	355	12	M24	26	320	3	26
25	425	370	12	M27	30	335	3	32
40	450	385	12	M30	33	345	3	42
64	470	400	12	M33	36	345	3	54
100	505	430	12	M36	39	345	3	72
160	515	430	12	M39	42	345	3	90
JIS								
5K	385	345	12	M20	23	320	2	22
10K	400	355	12	M22	25	325	2	24
16K	430	380	12	M24	27	345	2	28

14 in (350 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	20 3/4	18 1/2	8	7/8	1	-	-	7/8
D	20 3/4	18 1/2	12	7/8	1	-	-	7/8
E	20 3/4	18 1/2	12	7/8	1	-	-	1 1/8
F	21 3/4	19 1/2	16	1	1 1/8	-	-	1 3/8
H	21 3/4	19 1/2	16	1	1 1/8	16 1/2	1/16	1 7/8
J	21 3/4	19 1/2	16	1 1/8	1 1/4	16 1/2	1/16	2 1/4
K	22 1/2	20	16	1 1/4	1 3/8	16 1/2	1/16	2 5/8
R	23	20 3/4	16	1 1/4	1 3/8	16 1/2	1/16	3 1/8
S	25 1/2	22 3/4	20	1 1/2	1 5/8	17 1/4	1/16	4 1/8
T	-	-	-	-	-	-	-	-
ANSI								
150	21	18 3/4	12	1	1 1/8	16 1/4	1/16	1 3/8
300	23	20 1/4	20	1 1/8	1 1/4	16 1/4	1/16	2 1/8
600	23 3/4	20 3/4	20	1 3/8	1 1/2	16 1/4	1/4	2 3/4
900	25 1/2	22	20	1 1/2	1 5/8	16 1/4	1/4	3 3/8
1500	29 1/2	25	16	2 1/4	2 3/8	16 1/4	1/4	5 1/4
NP								
6	490	445	12	M20	22	415	4	26
10	505	460	16	M20	22	430	4	28
16	520	470	16	M24	26	438	4	32
25	555	490	16	M30	33	450	4	42
40	580	510	16	M33	36	465	4	56
64	600	525	16	M36	39	465	4	72
100	655	560	16	M45	48	465	4	95
160	-	-	-	-	-	-	-	-
JIS								
5K	480	435	12	M22	25	405	3	24
10K	490	445	16	M22	25	415	3	26
16K	540	480	16	M30	33	440	3	34

12 in (300 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	18	16	8	3/4	7/8	-	-	3/4
D	18	16	12	3/4	7/8	-	-	3/4
E	18	16	12	7/8	1	-	-	1
F	19 1/4	17 1/4	16	7/8	1	-	-	1 1/4
H	19 1/4	17 1/4	16	7/8	1	14 1/4	1/16	1 5/8
J	19 1/4	17 1/4	16	1	1 1/8	14 1/4	1/16	2
K	19 1/4	17	16	1 1/8	1 1/4	14 1/4	1/16	2 1/4
R	20	18	16	1 1/8	1 1/4	14 1/4	1/16	2 3/4
S	22 3/4	20	16	1 1/2	1 5/8	15	1/16	3 5/8
T	25 1/4	22 1/2	16	1 3/4	1 7/8	16 1/4	1/16	4 3/4
ANSI								
150	19	17	12	7/8	1	15	1/16	1 1/4
300	20 1/2	17 3/4	16	1 1/8	1 1/4	15	1/16	2
600	22	19 1/4	20	1 1/4	1 3/8	15	1/4	2 5/8
900	24	21	20	1 3/8	1 1/2	15	1/4	3 1/8
1500	26 1/2	22 1/2	16	2	2 1/8	15	1/4	4 7/8
NP								
6	440	395	12	M20	22	365	4	24
10	445	400	12	M20	22	370	4	26
16	460	410	12	M24	26	378	4	28
25	485	430	16	M27	30	395	4	38
40	515	450	16	M30	33	410	4	50
64	530	460	16	M33	36	410	4	62
100	585	500	16	M39	42	410	4	84
160	585	500	16	M39	42	410	4	106
JIS								
5K	430	390	12	M20	23	365	3	22
10K	445	400	16	M22	25	370	3	24
16K	480	430	16	M24	27	395	3	30

15 in (375 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	21 3/4	19 1/2	8	7/8	1	-	-	7/8
D	21 3/4	19 1/2	12	7/8	1	-	-	7/8
E	21 3/4	19 1/2	12	7/8	1	-	-	1 1/4
F	22 3/4	20 1/2	16	1	1 1/8	-	-	1 1/2
H	22 3/4	20 1/2	16	1	1 1/8	17 1/2	1/16	2
J	22 3/4	20 1/2	16	1 1/8	1 1/4	17 1/2	1/16	2 3/8
K	23 3/4	21 1/4	20	1 1/4	1 3/8	17 1/2	1/16	2 7/8
R	24	21 3/4	20	1 1/4	1 3/8	17 1/2	1/16	3 1/4
S	27 1/2	24 1/2	20	1 5/8	1 3/4	18 1/2	1/16	4 3/8
T	-	-	-	-	-	-	-	-
ANSI								
150	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-
600	-	-	-	-	-	-	-	-
900	-	-	-	-	-	-	-	-
1500	-	-	-	-	-	-	-	-
NP								
6	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-
160	-	-	-	-	-	-	-	-
JIS								
5K	-	-	-	-	-	-	-	-
10K	-	-	-	-	-	-	-	-
16K	-	-	-	-	-	-	-	-

16 in (400 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	$22\frac{3}{4}$	$20\frac{1}{2}$	12	$\frac{7}{8}$	1	-	-	$\frac{7}{8}$
D	$22\frac{3}{4}$	$20\frac{1}{2}$	12	$\frac{7}{8}$	1	-	-	$\frac{7}{8}$
E	$22\frac{3}{4}$	$20\frac{1}{2}$	12	$\frac{7}{8}$	1	-	-	$1\frac{1}{4}$
F	24	$21\frac{3}{4}$	20	1	$1\frac{1}{8}$	-	-	$1\frac{5}{8}$
H	24	$21\frac{3}{4}$	20	1	$1\frac{1}{8}$	19	$\frac{1}{16}$	$2\frac{1}{8}$
J	24	$21\frac{3}{4}$	20	$1\frac{1}{8}$	$1\frac{1}{4}$	19	$\frac{1}{16}$	$2\frac{1}{2}$
K	$24\frac{3}{4}$	$22\frac{1}{4}$	20	$1\frac{1}{4}$	$1\frac{3}{8}$	19	$\frac{1}{16}$	3
R	$25\frac{1}{4}$	23	20	$1\frac{1}{4}$	$1\frac{3}{8}$	19	$\frac{1}{16}$	$3\frac{1}{2}$
S	$29\frac{1}{4}$	26	20	$1\frac{3}{4}$	$1\frac{7}{8}$	$19\frac{1}{2}$	$\frac{1}{16}$	$4\frac{5}{8}$
T	-	-	-	-	-	-	-	-
ANSI								
150	$23\frac{1}{2}$	$21\frac{1}{4}$	16	1	$1\frac{1}{8}$	$18\frac{1}{2}$	$\frac{1}{16}$	$1\frac{7}{16}$
300	$25\frac{1}{2}$	$22\frac{1}{2}$	20	$1\frac{1}{4}$	$1\frac{3}{8}$	$18\frac{1}{2}$	$\frac{1}{16}$	$2\frac{1}{4}$
600	27	$23\frac{3}{4}$	20	$1\frac{1}{2}$	$1\frac{5}{8}$	$18\frac{1}{2}$	$\frac{1}{4}$	3
900	$27\frac{3}{4}$	$24\frac{1}{4}$	20	$1\frac{5}{8}$	$1\frac{3}{4}$	$18\frac{1}{2}$	$\frac{1}{4}$	$3\frac{1}{2}$
1500	$32\frac{1}{2}$	$27\frac{3}{4}$	16	$2\frac{1}{2}$	$2\frac{5}{8}$	$18\frac{1}{2}$	$\frac{1}{4}$	$5\frac{3}{4}$
NP								
6	540	495	16	M20	22	465	4	28
10	565	515	16	M24	26	482	4	32
16	580	525	16	M27	30	490	4	36
25	620	550	16	M33	36	505	4	46
40	660	585	16	M36	39	535	4	64
64	670	585	16	M39	42	535	4	78
100	715	620	16	M45	48	535	4	106
160	-	-	-	-	-	-	-	-
JIS								
5K	540	495	16	M22	25	465	3	24
10K	560	510	16	M24	27	475	3	28
16K	605	540	16	M30	33	495	3	38

18 in (450 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	$25\frac{1}{4}$	23	12	$\frac{7}{8}$	1	-	-	$\frac{7}{8}$
D	$25\frac{1}{4}$	23	12	$\frac{7}{8}$	1	-	-	1
E	$25\frac{1}{4}$	23	16	$\frac{7}{8}$	1	-	-	$1\frac{3}{8}$
F	$26\frac{1}{2}$	24	20	$1\frac{1}{8}$	$1\frac{1}{4}$	-	-	$1\frac{3}{4}$
H	$26\frac{1}{2}$	24	20	$1\frac{1}{8}$	$1\frac{1}{4}$	21	$\frac{1}{16}$	$2\frac{3}{8}$
J	$26\frac{1}{2}$	24	20	$1\frac{1}{4}$	$1\frac{3}{8}$	21	$\frac{1}{16}$	$2\frac{3}{4}$
K	$28\frac{1}{4}$	$25\frac{3}{4}$	20	$1\frac{3}{8}$	$1\frac{1}{2}$	$22\frac{1}{2}$	$\frac{1}{16}$	$3\frac{1}{2}$
R	29	$26\frac{1}{2}$	20	$1\frac{3}{8}$	$1\frac{1}{2}$	$22\frac{1}{2}$	$\frac{1}{16}$	$3\frac{7}{8}$
S	-	-	-	-	-	-	-	-
T	-	-	-	-	-	-	-	-
ANSI								
150	25	$22\frac{3}{4}$	16	$1\frac{1}{8}$	$1\frac{1}{4}$	21	$\frac{1}{16}$	$1\frac{9}{16}$
300	28	$24\frac{3}{4}$	24	$1\frac{1}{4}$	$1\frac{3}{8}$	21	$\frac{1}{16}$	$2\frac{3}{8}$
600	$29\frac{1}{4}$	$25\frac{3}{4}$	20	$1\frac{5}{8}$	$1\frac{3}{4}$	21	$\frac{1}{4}$	$3\frac{1}{4}$
900	31	27	20	$1\frac{7}{8}$	2	21	$\frac{1}{4}$	4
1500	36	$30\frac{1}{2}$	16	$2\frac{3}{4}$	$2\frac{7}{8}$	21	$\frac{1}{4}$	$6\frac{3}{8}$
NP								
6	595	550	16	M20	22	520	4	30
10	615	565	20	M24	26	532	4	36
16	640	585	20	M27	30	550	4	40
25	670	600	20	M33	36	555	4	52
40	685	610	20	M36	39	560	4	68
64	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-
160	-	-	-	-	-	-	-	-
JIS								
5K	605	556	16	M22	25	525	3	24
10K	620	565	20	M24	27	530	3	30
16K	675	605	20	M30	33	560	3	40

20 in (500 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	$27\frac{3}{4}$	$25\frac{1}{4}$	12	$\frac{7}{8}$	1	-	-	1
D	$27\frac{3}{4}$	$25\frac{1}{4}$	16	$\frac{7}{8}$	1	-	-	$1\frac{1}{8}$
E	$27\frac{3}{4}$	$25\frac{1}{4}$	16	$\frac{7}{8}$	1	-	-	$1\frac{1}{2}$
F	29	$26\frac{1}{2}$	24	$1\frac{1}{8}$	$1\frac{1}{4}$	-	-	2
H	29	$26\frac{1}{2}$	24	$1\frac{1}{8}$	$1\frac{1}{4}$	$23\frac{1}{2}$	$\frac{1}{16}$	$2\frac{5}{8}$
J	29	$26\frac{1}{2}$	24	$1\frac{1}{4}$	$1\frac{3}{4}$	$23\frac{1}{2}$	$\frac{1}{16}$	$3\frac{1}{8}$
K	31	28	20	$1\frac{1}{2}$	$1\frac{5}{8}$	$24\frac{1}{2}$	$\frac{1}{16}$	$3\frac{7}{8}$
R	$31\frac{3}{4}$	$28\frac{3}{4}$	20	$1\frac{1}{2}$	$1\frac{5}{8}$	$24\frac{1}{2}$	$\frac{1}{16}$	$4\frac{1}{8}$
S	-	-	-	-	-	-	-	-
T	-	-	-	-	-	-	-	-
ANSI								
150	$27\frac{1}{2}$	25	20	$1\frac{1}{8}$	$1\frac{1}{4}$	23	$\frac{1}{16}$	$1\frac{11}{16}$
300	$30\frac{1}{2}$	27	24	$1\frac{1}{4}$	$1\frac{3}{8}$	23	$\frac{1}{16}$	$2\frac{1}{2}$
600	32	$28\frac{1}{2}$	24	$1\frac{5}{8}$	$1\frac{3}{4}$	23	$\frac{1}{4}$	$3\frac{1}{2}$
900	$33\frac{3}{4}$	$29\frac{1}{2}$	20	2	$2\frac{1}{8}$	23	$\frac{1}{4}$	$4\frac{1}{4}$
1500	$38\frac{3}{4}$	$32\frac{3}{4}$	16	3	$3\frac{1}{8}$	23	$\frac{1}{4}$	7
NP								
6	645	600	20	M20	22	570	4	30
10	670	620	20	M24	26	585	4	38
16	715	650	20	M30	33	610	4	44
25	730	660	20	M33	36	615	4	58
40	755	670	20	M39	42	615	4	72
64	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-
160	-	-	-	-	-	-	-	-
JIS								
5K	655	605	20	M22	25	575	3	24
10K	675	620	20	M24	27	585	3	30
16K	730	660	20	M30	33	615	3	42

24 in (600 mm) nominal bore.

Table	Dia. of flange in	Bolt Circle dia. in	Number of bolts	Dia. of bolts in	Dia. of holes in	Dia. of raised face in	Height of raised face in	Thickness of flange in
BS								
A	$32\frac{1}{2}$	$29\frac{3}{4}$	12	1	$1\frac{1}{8}$	-	-	1
D	$32\frac{1}{2}$	$29\frac{3}{4}$	16	1	$1\frac{1}{8}$	-	-	$1\frac{1}{4}$
E	$32\frac{1}{2}$	$29\frac{3}{4}$	16	$1\frac{1}{8}$	$1\frac{1}{4}$	-	-	$1\frac{7}{8}$
F	$33\frac{1}{2}$	$30\frac{3}{4}$	24	$1\frac{1}{4}$	$1\frac{3}{8}$	-	-	$2\frac{1}{4}$
H	$33\frac{1}{2}$	$30\frac{3}{4}$	24	$1\frac{1}{4}$	$1\frac{3}{8}$	$27\frac{1}{2}$	$\frac{1}{16}$	3
J	$33\frac{1}{2}$	$30\frac{3}{4}$	24	$1\frac{3}{8}$	$1\frac{1}{2}$	$27\frac{1}{2}$	$\frac{1}{16}$	$3\frac{5}{8}$
K	-	-	-	-	-	-	-	-
R	-	-	-	-	-	-	-	-
S	-	-	-	-	-	-	-	-
T	-	-	-	-	-	-	-	-
ANSI								
150	32	$29\frac{1}{2}$	20	$1\frac{1}{4}$	$1\frac{3}{8}$	$27\frac{1}{4}$	$\frac{1}{16}$	$1\frac{7}{8}$
300	36	32	24	$1\frac{1}{2}$	$1\frac{5}{8}$	$27\frac{1}{4}$	$\frac{1}{16}$	$2\frac{3}{4}$
600	37	33	24	$1\frac{7}{8}$	2	$27\frac{1}{4}$	$\frac{1}{4}$	4
900	41	$35\frac{1}{2}$	20	$2\frac{1}{2}$	$2\frac{5}{8}$	$27\frac{1}{4}$	$\frac{1}{4}$	$5\frac{1}{2}$
1500	46	39	16	$3\frac{1}{2}$	$3\frac{5}{8}$	$27\frac{1}{4}$	$\frac{1}{4}$	8
NP								
6	755	705	20	M24	26	670	5	32
10	780	725	20	M27	30	685	5	42
16	840	770	20	M33	36	725	5	52
25	845	770	20	M36	39	720	5	66
40	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-
160	-	-	-	-	-	-	-	-
JIS								
5K	770	715	20	M24	27	680	3	26
10K	795	730	24	M30	33	690	3	32
16K	845	770	24	M36	39	720	3	46

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Conversion Tables

Inches and sixteenths to millimetres

Inch = 25.4 mm

Inch	0	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	Inch
0		1.58	3.17	4.76	6.35	7.93	9.52	11.11	12.70	14.28	15.87	17.46	19.05	20.03	22.22	23.81	0
1	25.400	26.98	28.57	30.16	31.74	33.33	34.92	36.51	38.09	39.68	41.27	42.86	44.44	46.03	47.62	49.21	1
2	50.799	52.38	53.97	55.56	57.14	58.73	60.32	61.91	63.49	65.08	66.67	68.26	69.84	71.43	73.02	74.61	2
3	76.199	77.78	79.37	80.96	82.54	84.13	85.72	87.31	88.89	90.48	92.07	93.66	95.24	96.83	98.42	100.01	3
4	101.60	103.19	104.77	106.36	107.54	109.54	111.12	112.71	114.30	115.89	117.47	119.06	120.65	122.24	123.82	125.41	4
5	127.00	128.59	130.17	131.76	133.35	134.94	136.52	138.11	139.70	141.28	142.87	144.46	146.05	147.63	149.22	150.81	5
6	152.40	153.98	155.57	157.16	158.75	160.33	161.92	163.51	165.10	166.68	168.27	169.86	171.45	173.03	174.62	176.21	6
7	177.80	179.38	180.97	182.56	184.15	185.73	187.32	188.91	190.50	192.08	193.67	195.26	196.85	198.43	200.02	201.61	7
8	203.20	204.78	206.37	207.96	209.55	211.13	212.72	214.31	215.90	217.48	219.07	220.66	222.25	223.83	225.42	227.01	8
9	223.60	230.18	231.77	233.36	234.95	236.53	238.12	239.71	241.30	242.88	244.47	246.06	247.65	249.23	250.82	252.41	9
10	254.00	255.58	257.17	258.76	260.35	261.93	263.52	265.11	266.70	268.28	269.87	271.46	273.05	274.63	276.22	277.81	10
11	279.39	280.98	282.57	284.16	285.74	287.33	288.92	290.51	292.09	293.68	295.27	296.86	298.44	300.03	301.62	303.21	11
12	304.79	306.38	307.97	309.57	311.14	312.73	314.32	315.91	317.49	319.08	320.67	322.26	323.84	325.43	327.02	328.61	12
13	330.19	331.78	333.37	334.96	336.54	338.13	339.72	341.31	342.89	344.48	346.07	347.66	349.24	350.83	352.42	354.01	13
14	355.59	357.18	358.77	360.36	361.94	363.53	365.12	366.71	368.29	369.88	371.47	373.06	374.64	376.23	377.82	379.41	14
15	380.99	382.58	384.17	385.76	387.76	388.93	390.52	392.11	393.69	395.28	396.87	398.46	400.04	401.63	403.22	404.81	15
16	406.39	407.98	409.57	411.16	412.74	414.33	415.92	417.50	419.09	420.68	422.27	423.85	425.44	427.03	428.62	430.20	16
17	431.79	433.38	434.97	436.55	438.14	439.73	441.32	442.90	444.49	446.08	447.67	449.25	450.84	452.43	454.02	455.60	17
18	457.19	458.78	460.37	461.95	463.54	465.13	466.72	468.30	469.89	471.48	473.07	474.65	476.24	477.83	479.42	481.00	18

Feet and inches to metres

10' 6" = 3200 mm

Feet	0	1	2	3	4	5	6	7	8	9	10	11	12
Ins													
0	0.0	0.305	0.610	0.914	1.219	1.524	1.829	2.133	2.438	2.743	3.048	3.352	3.657
1	0.0254	0.330	0.635	0.940	1.244	1.549	1.854	2.158	2.463	2.768	3.073	3.378	3.682
2	0.0508	0.356	0.660	0.965	1.269	1.575	1.880	2.184	2.489	2.794	3.099	3.403	3.708
3	0.0762	0.381	0.686	0.991	1.295	1.600	1.905	2.209	2.514	2.819	3.124	3.429	3.733
4	0.1016	0.406	0.711	1.016	1.320	1.626	1.931	2.235	2.540	2.844	3.150	3.454	3.759
5	0.1270	0.432	0.737	1.041	1.346	1.651	1.956	2.260	2.565	2.870	3.175	3.479	3.784
6	0.1524	0.457	0.762	1.066	1.371	1.676	1.981	2.286	2.590	2.895	3.200	3.505	3.810
7	0.1778	0.483	0.787	1.092	1.397	1.702	2.007	2.311	2.616	2.921	3.226	3.530	3.835
8	0.2032	0.508	0.813	1.117	1.422	1.727	2.032	2.336	2.641	2.946	3.251	3.555	3.860
9	0.2286	0.533	0.838	1.142	1.448	1.753	2.057	2.362	2.667	2.972	3.276	3.581	3.886
10	0.2540	0.559	0.864	1.168	1.473	1.778	2.083	2.387	2.692	2.997	3.302	3.606	3.911
11	0.2794	0.584	0.889	1.193	1.498	1.803	2.108	2.412	2.717	3.022	3.327	3.362	3.936

Pressure conversion: lbf/in² to Kg/cm² and bars

lb/in²	kg/cm²	Bar
1	0.07031	0.06895
14.22	1	0.9807
14.5	1.0197	1

lbf/in²		0	10	20	30	40	50	60	70	80	90
0	Kg/cm²		0.703	1.400	2.109	2.812	3.515	4.219	4.922	5.625	6.328
	Bars		0.689	1.379	2.069	2.758	3.448	4.137	4.827	5.516	6.206
100	Kg/cm²	7.031	7.734	8.437	9.140	9.843	10.546	11.249	11.952	12.656	13.359
	Bars	6.895	7.585	8.274	8.964	9.653	10.343	11.032	11.722	12.411	13.101
200	Kg/cm²	14.06	14.77	15.47	16.17	16.87	17.58	18.28	18.98	19.69	20.39
	Bars	13.79	14.48	15.17	15.86	16.55	17.24	17.93	18.62	19.31	20.00
300	Kg/cm2	21.09	21.80	22.50	23.20	23.91	24.61	25.31	26.01	26.72	27.42
	Bars	20.69	21.37	22.06	22.75	23.44	24.13	24.82	25.51	26.20	26.89
400	Kg/cm2	28.12	28.83	29.53	30.23	30.94	31.64	32.34	33.05	33.75	34.45
	Bars	27.58	28.27	28.96	29.65	30.34	31.03	31.72	32.41	33.10	33.79
500	Kg/cm2	35.15	35.86	36.56	37.26	37.97	38.67	39.37	40.08	40.78	41.48
	Bars	34.48	35.16	35.85	36.54	37.23	37.92	38.61	39.30	39.99	40.68
600	Kg/cm2	42.19	42.89	43.59	44.29	45.00	45.70	46.40	47.11	47.81	48.51
	Bars	41.37	42.05	42.75	43.44	44.13	44.82	45.51	46.20	46.89	47.58
700	Kg/cm2	49.22	49.92	50.62	51.33	52.03	52.73	53.44	54.14	54.84	55.54
	Bars	48.27	48.95	49.64	50.33	51.02	51.71	52.40	53.09	53.78	54.47
800	Kg/cm2	56.25	56.95	57.65	58.36	59.06	59.76	60.47	61.17	61.87	62.58
	Bars	55.16	55.85	56.54	57.23	57.92	58.61	59.30	59.99	60.68	61.37
900	Kg/cm2	63.28	63.98	64.68	65.39	66.09	66.79	67.50	68.20	68.90	69.61
	Bars	62.06	62.74	63.43	64.12	64.81	65.50	66.19	66.88	67.57	68.26
1000	Kg/cm2	70.31	-	-	-	-	-	-	-	-	-
	Bars	68.95	-	-	-	-	-	-	-	-	-

Temperature Conversion

Cent.	Fahren.	Cent	Fahren	Fahren	Cent	Fahren	Cent
100	212	37	98.6	212	100	101	38.3
95	203	36	96.8	200	93.3	100	37.8
90	194	35	95	190	87.8	99	37.2
85	185	34	93.2	180	82.2	98	36.7
80	176	33	91.4	170	76.7	97	36.1
75	167	32	89.6	160	71.1	96	35.6
70	158	31	87.8	150	65.6	95	35
65	149	30	86	140	60	90	32.2
60	140	25	77	130	54.4	80	26.7
55	131	20	68	120	48.9	70	21.1
50	122	15	59	110	43.3	60	15.6
45	113	10	50	105	40.6	50	10
40	104	5	41	104	40	40	4.4
39	102.2	0	32	103	39.4	32	0
38	100.4			102	38.9		

Centigrade to Fahrenheit: $C = \frac{5}{9}$ (F-32)

Divide by 5, multiply by 9 and add 32

Example: 260 Cent, ÷ 5 = 52   52 x 9 = 468 + 32 = 500 Fahr.

Ans. 260 Cent. = 500 Fahr.

To convert Fahrenheit into Centrigrade: $F = 32 + \frac{9}{5}$ C

Subtract 32 from Fahrenheit and divide remainder by 9 and mulitply by 5

Example: 212 Fahr.

$\frac{32}{180}$ 180 ÷ 9 = 20.   20 x 5 = 100

Ans. 212 Fahr. = 100 Cent.